



**Imperial College  
London**

**Railway and Transport Strategy Centre**

# **The Operator's Story**

## **Appendix: Toronto's Story**

© World Bank / Imperial College London  
Property of the World Bank and the RTSC at Imperial College London



Community of Metros  
**CoMET**



# **The Operator's Story: Notes from Toronto Case Study Interviews**

*February 2017*

## **Purpose**

The purpose of this document is to provide a permanent record for the researchers of what was said by people interviewed for 'The Operator's Story' in Toronto, Canada. These notes are based upon 11 meetings between the 9<sup>th</sup> and 12<sup>th</sup> May 2016. This document will ultimately form an appendix to the final report for 'The Operator's Story' piece. Although the findings have been arranged and structured by Imperial College London, they remain a collation of thoughts and statements from interviewees, and continue to be the opinions of those interviewed, rather than of Imperial College London. Prefacing the notes is a summary of Imperial College's key findings based on comments made, which will be drawn out further in the final report for 'The Operator's Story'.

## **Method**

This content is a collation in note form of views expressed in the interviews that were conducted for this study. Comments are not attributed to specific individuals, as agreed with the interviewees and Toronto Transit Commission (TTC).

## **List of interviewees**

Meetings include the following TTC members:

- Andy Byford (Chief Executive Officer)
- Gary Shortt (Chief Operating Officer)
- Mike Palmer (Deputy Chief Operating Officer – Subways)
- Joan Taylor (Chief of Staff)
- Vince Rodo (Chief Financial and Administration Officer)
- Rick Leary (Chief Service Officer)
- Chris Upfold (Chief Customer Officer)
- James Fraser (Head of Capital Programming)
- Scott Haskill (Senior Planner – Transit Service)
- Arthur Borkwood (Head of Customer Development)
- Richard Thompson (Chief Project Manager, Scarborough Subway Extension)
- Pamela Kraft (Head, Property Planning and Development)
- Mary-Ann George (Senior Transport Planner).

---

**Indicative Exchange rate**    CAD\$1 = US\$0.75 = GBP 0.5

---

## Key Messages: Relevance to International Learning about Metro Operators

This case study illustrates a large variety of international lessons about metro operations. Key lessons for operators include:

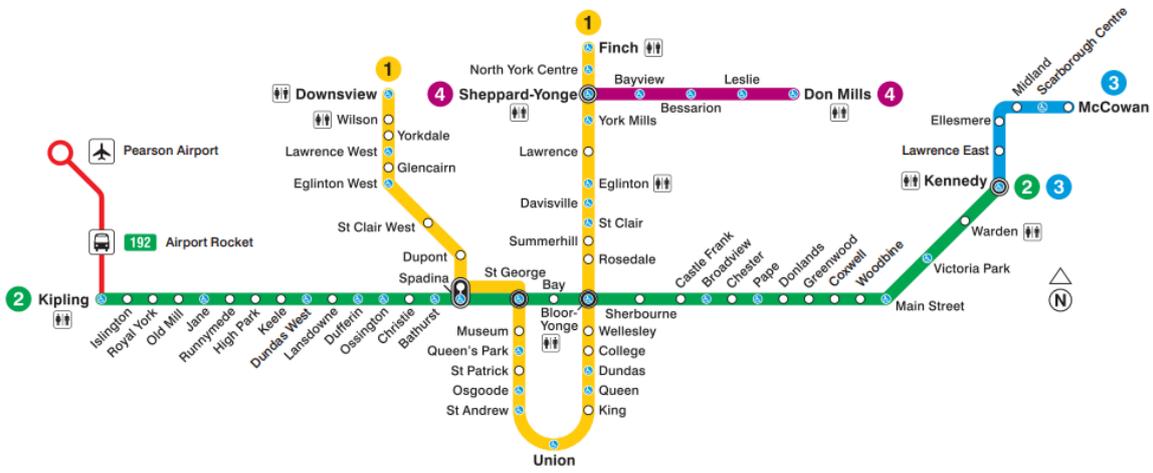
- Establishing new metros with **multiple levels of decision-making** creates vulnerability and volatility in the planning and financial environment. TTC's Board, its first point of accountability, is essentially a political body composed of representatives of Toronto City Council. Above this, there are decisions affecting TTC that can be taken at the City, Provincial and national levels.
- TTC have proved adept at **engaging upwards within an intensely political environment**, partly through its strong leadership, and partly through its demonstrated technical competence. Its first point of accountability is essentially a political body which means that they have to engage at the political level in order to succeed. An example of this is TTC's formulation of 9 prioritised, beneficial and implementable "quick wins" in 2014, all of which were accepted by the Board.
- Operator engagement with a **receptive authority** benefits the city in question. This requires strong and proactive metro leadership. This type of engagement is likely to increase the prospect of predictable funding and install a long-term, sustainable view of metro operations within the authority itself.
- The transformative effect of **leadership** is clearly demonstrated in Toronto. With Andy Byford's appointment in 2012, a new strategy was created spanning the full range of TTC responsibilities. This ranges from improving the company culture through proactive engagement with its workforce, to new focus on the company's asset management practices. It also includes increased effort to improve TTC's proactivity, professionalism and success in operations through securing the \$1billion (USD 750 million equ.) per annum it needs to keep the system operating, rather than focusing company efforts towards securing this funding on a repetitive basis.
- The shape of a city largely determines the right strategy for success. In the case of TTC, bus services are essential to feeding the metro system given Toronto's relatively low density of development. TTC "**think integration**" and understand that as an operator, it provides efficiency, certainty, opportunity for non-fare revenue, as well as a much improved experience for the customer. Without this integrated network, it is possible that a metro in a city formed like Toronto may not be viable.
- There have been notable examples of **innovative funding** for transport projects and TTC note that the public are accepting of certain taxes if they understand its utility and benefit. For example, the Scarborough subway was planned to be part-funded by the City levying an earmarked 0.5% property tax over 30 years, and a 10-year Water Renewal strategy was also funded by the City levying a 9% earmarked property tax.
- **Asset management information** is itself an asset and internal asset knowledge cannot be outsourced. Managing asset management information across a common system avoids individual silos of fragmented information. It is important to recognise that asset information is easiest managed for assets that are standard and found within other industries, whereas it is most difficult for transit-only, such as tunnels and signalling systems. A positive view is that asset management is necessary from the outset of design. By using a Building Information Management (BIM) system from the beginning "*you're giving them a fighting chance from day 1 to run the system*".
- "*Once you lose a state of good repair it's almost impossible to catch up*". Not only do assets need to be rehabilitated but also enhanced and replaced. To understand the 'state of good repair', a **rigorous asset management system** is necessary and an understanding of the

life-cycle of all assets. Metro operators must be able to answer the question: ‘How can the funds available have a major beneficial impact?’”

- Doing projects in the wrong order will increase cost and cause constant undoing of previous work. These **economies of planning** are only possible if underpinned by guaranteed funding, particularly for later project stages within the modernisation portfolio. TTC observe that if people understand funding is going towards public transport, they are likely to be generally supportive, and as much flexibility as possible should be provided to the transport agency to allocate funding between projects according to a well-justified set of priorities.
- TTC recommend creating a special card for **travellers with discounts**, which could either be managed by the transit agency or a special prepay bank card programmed to charge discount fares. A special smartcard for passenger requiring discounts or concessionary fares could also be managed by the transport agency or via a stored-value bank card programmed to charge discounted fares.
- TTC’s policy is to be **open and transparent** alongside Freedom of Information (Fol) legislation, their approach being: *“if it’s public make it public”* (e.g. put it on the website). All operational data is now open data and accessible to anyone wishing to develop an App and information is available unless personal, although this does create a burden on resources. If this is going to be an organisational approach, resources must be planned to ensure an obligation to be open and transparent can be met.

# Transit Map

## Subway Map



- 1 Yonge-University Line
- 2 Bloor-Danforth Line
- 3 Scarborough Line
- 4 Sheppard Line
- Interchange station
- Accessible station

### Hours of operation

Weekday & Saturday service approximately 6 a.m. to 1:30 a.m.  
 Sunday service approximately 8 a.m. to 1:30 a.m.  
 Holiday start times vary

ttc.ca | Information: 416-393-4636 | Customer Service: 416-393-3030

YouTube Facebook @TTCnotices @TTChelps

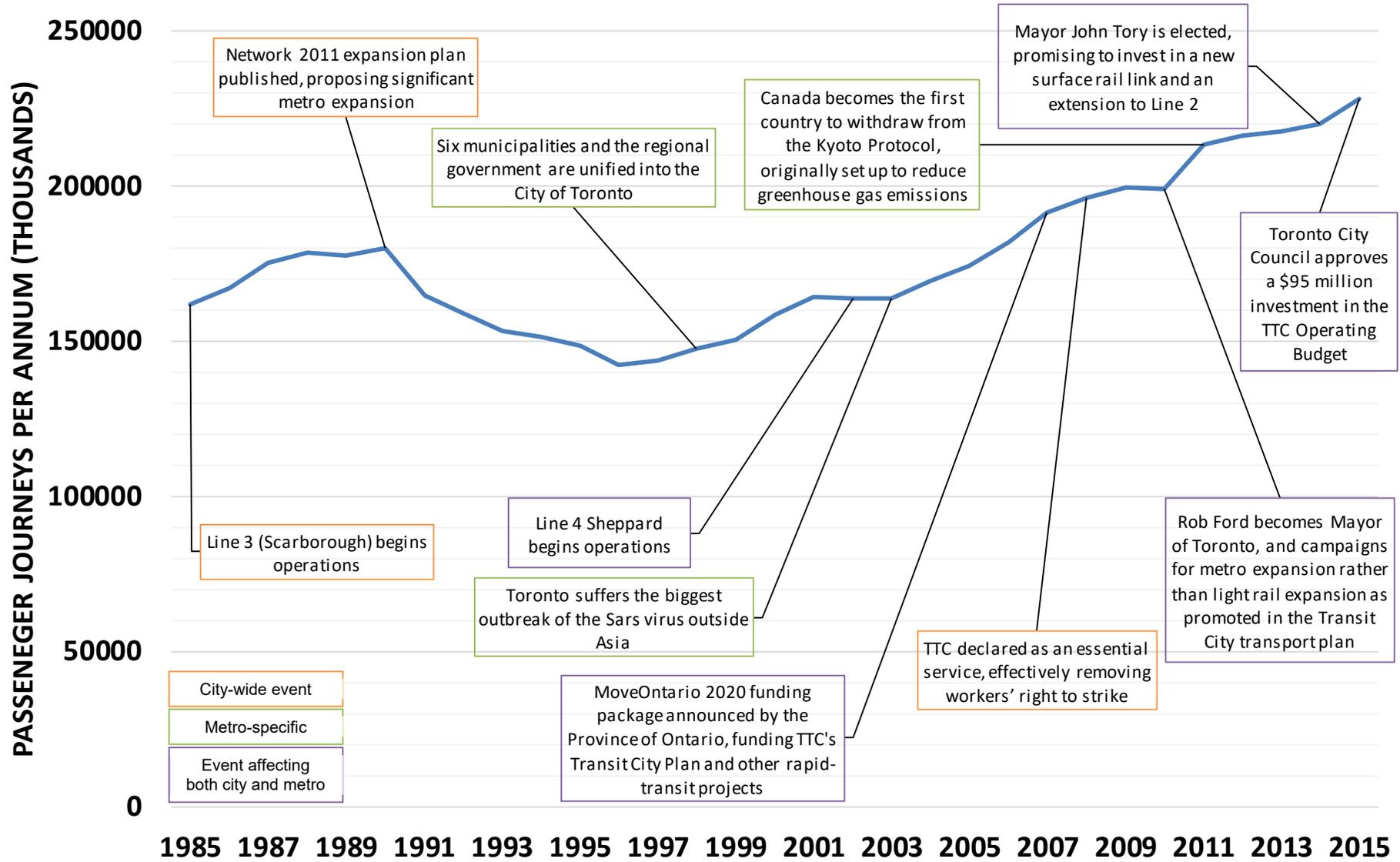
©2017 Toronto Transit Commission 02/17 – Map not to scale.



## **Growth in Passenger Journeys and Key Events in Toronto**

The following graph demonstrates TTC's growth in passenger journeys from 1985-2015 and includes selected key surrounding events that took place in Toronto or nationally in the Canada, and selected events in the history of TTC.

# Toronto: Passenger Journey Profile and Key Events



## General Summary of Toronto Transit Commission (TTC)

GENERAL SUMMARY		
Background and history		<ul style="list-style-type: none"> <li>▪ TTC is North America’s third largest transit system after New York and Mexico City. Critically it has the lowest subsidy per passenger of all North America’s transit systems. The first line opened in 1954 (known as the “Yonge subway”), followed by Line 2 Bloor–Danforth in 1966, Line 3 Scarborough in 1985 and Line 4 Sheppard in 2002.</li> <li>▪ An 8.6km extension of Line 1 Yonge-University-Spadina is under construction, planned to open in late 2017. Line 5 Eglinton (also known as the Eglinton Crosstown) is a 19km light rail line under construction scheduled to open in 2021. There is also a plan to extend Line 2 from Kennedy station to Scarborough Town Centre, and consequently dismantle Line 3, which has reached the end of its design life.</li> <li>▪ TTC operate a fully integrated public transport system, including metro, streetcars and buses.</li> </ul>
Key dates and why they matter	1921	The Toronto Transportation Commission is formed by Provincial Act to amalgamate and operate public transport in Toronto. The system in 1921 consists primarily of streetcars and buses.
	1946	During World War II, car travel patterns between the downtown core and industrial areas of the city strained the road network. Future predicted patterns of car ownership and existing travel conditions initiated Toronto City Council to approve construction of a rapid transit subway and a surface car subway, conceptualising a rapid-transit based system in Toronto. A referendum is held on whether a metro should be constructed on Yonge Street and receives widespread support.
	1949	Construction of a scaled down proposal of the new subway commences in September, following post-war labour shortages.
	1951	Toronto’s population is recorded at over a million people following immigration to the city.
	1954	The Toronto Transportation Commission becomes the Toronto Transit Commission, and responsibility for public transport is conferred to the newly-created Municipality of Metropolitan Toronto. The Municipality of Metropolitan Toronto would be responsible for arterial roads, regional planning, public transportation, metropolitan parks and housing, as well as several other areas. TTC acquires all remaining public transport services in the city, becoming the sole provider of public transport.
	1954	The Yonge subway opens in March connecting Union Station to Eglinton Avenue, replacing the surface streetcar route.  Hurricane Hazel, the deadliest and costliest hurricane of 1954 causes 81 fatalities and widespread infrastructural damage. New construction specifications and procedures for construction were defined and new flood defences were built.
	1960s - 1970s	As a consequence of population growth, the urban layout of the city was transformed. Streets and small plots of land were replaced by mega-blocks with limited streets and apartment buildings, and downtown Toronto was rebuilt with new, tall skyscrapers, to function as the commercial and business centre of the city.

1962	The Metropolitan Toronto and Region Transportation Study is carried out to assess likely transportation needs in the future across the full scope of the metropolitan Toronto region.
1963	An incident occurs on the network caused by an electrical short-circuit on a subway car. The driver kept the train in operation and a subsequent fire destroyed six subway cars and substantial tunnel and cable damage. Following this incident, safety procedures involving electrical malfunctions and/or fire in subway trains were revised to improve safety and reduce the likelihood of a similar incident occurring.
1966	Line 2 Bloor-Danforth begins operations from Keele station to Woodbine station.
1967	GO Transit is established and becomes the first passenger rail system in Canada, owned by the Government of Ontario. The system proved popular, serving commuters that had previously used the Canadian National Railway, a company previously unable to expand into new districts.
1971	Toronto's population is recorded as over two million by 1971. Growth in city infrastructure is attributed as a key driver to this population increase.
1976	A suspicious fire caused the destruction of four subway cars and damage to Christie Station. It resulted in the closure of the Bloor-Danforth line for three days, and the subsequent closure of Christie Station for repairs.
1978	A newly elected provincial Progressive Conservative government cancelled its share of funding that would have extended the Yonge subway northward to York University and Steeles Avenue. This extension is currently under construction (2016), and funding has been committed by governments.
1980	Extensions were added in 1980 at both extents of the Bloor-Danforth line, creating its current alignment with termini at Kennedy station and Kipling station. These extensions consisted of new stations and bus bays to connect to surface bus routes.
1981	The population of Toronto is recorded as 3 million people, surpassing the city of Montreal.
1985	The Scarborough RT (today's Line 3 Scarborough) opens. It was Toronto's only intermediate-capacity line built almost entirely above ground and is powered by linear induction motors, a unique technology on the system. This technology attracts lower maintenance costs and suits a surface-based rail system as trains are able to climb higher gradients than wheel-based trains. The line adds connectivity to the Bloor-Danforth Line 2.
1990	The Network 2011 expansion plan is published, proposing metro expansion to nearly twice its size, although this plan was largely unacted upon.
1990s	Toronto is impacted by a national recession spurred by global financial events. North America was particularly affected primarily owing to its savings and loans industries.

1995	Mike Harris becomes the Premier of Ontario and implements a policy agenda marketed as a “Common Sense Revolution”, including mergers of municipalities and cutting infrastructure spending. The Eglinton West LRT line, already under construction at the time of Premier Mike Harris’s election to office, is cancelled.
1995	An accident occurs on the Yonge-University line south of St. Clair West Station, and is recorded as the deadliest subway accident in Canadian history, referred to as the Russell Hill accident. The accident caused three fatalities and over a hundred injuries. This led the TTC (TTC) to increase the emphasis on safety and maintenance of existing TTC assets, rather than on network expansion. The accident also identified signalling flaws contributing to the accident, leading to a system redesign to improve safety including a Speed Control System.
1998	The six municipalities comprising the Municipality of Metropolitan Toronto and its regional government were unified into the City of Toronto (also known as the Megacity). This newly formed region became responsible for its public transport funding, having previously received the majority of funding for capital transport projects from the Province of Ontario.
2002	Line 4 Sheppard begins operations, the shortest of the metro lines on the system at 5.5km long, although the full extent of the line did not get built owing to funding pressures. All stations are fully wheelchair accessible and are decorated with unique public art. The Sheppard line has fewer riders than the system’s other two lines, and shorter trains are put into service.
2007	The Transit City Plan is announced, proposing seven new light rail lines along priority corridors and an upgrade to the Line 3 Scarborough.
2007	The Province of Ontario announces the MoveOntario 2020 funding package for 52 rapid-transit projects, including TTC’s Transit City Plan.
2008	“Bill 66”, an Act to resolve labour disputes between the TTC and a local chapter of the Amalgamated Transit Union is passed by the Provincial Government, ending a disruptive strike. This included declaring the TTC as an essential service in Toronto, effectively removing workers’ right to strike in future.
2008	A propane explosion occurs in Toronto, causing the evacuation of thousands of people using TTC buses, and closing major arterial highways. The clean-up effort requires funding from the Province.
2010	Mayor Rob Ford rescinds the majority of the Transit City plan in favour of metro expansion, rather than light rail expansion. In 2012, Toronto City Council members eventually vote in favour of retaining three light rail lines and the Line 3 Scarborough upgrade.
2010	Toronto hosts the G-20 summit in June. TTC decided to leave the subway stations near the convention centre open and operational, despite some diverted bus routes and the closure of Queens Quay Station.

	2010-2011	Mayor Rob Ford promises to remove cycle lanes as part of his previous mayoral campaign and newly installed cycle lanes (in 2010) were removed in 2011. This sparked protests and it is estimated that the installation and subsequent removal of the cycle lanes cost up to \$300,000 (USD 225 million)
	2011	Crisis Link, a suicide and self-harm prevention programme, is launched by TTC. This included speed dial buttons on payphones connected to a counselling service and in-station signage.
	2012	TTC Chief Executive Officer Andy Byford launches a five-year Corporate Plan aimed at modernising TTC's operations and achieving world-class levels of service.
	2013	A strong ice storm causes significant infrastructure damage, making it Ontario's most costly natural disaster. Subway service between Bloor and Eglinton stations was suspended for much of the day of the ice storm, as was service on the Scarborough RT and Sheppard lines.
	2014	John Tory becomes Mayor of Toronto and promotes a new surface rail link, SmartTrack, primarily to relieve Line 1 Yonge-University-Spadina. Mayor Tory also promotes an extension to Line 2 over a new line through Scarborough, which is subsequently approved.
	2015	The TTC Board approve an external firm to complete the Spadina extension to expedite the project's completion.
	2015	The Pan American Games are held in Toronto. The Union Pearson Express (a rail link connecting the airport with Union Station) opened in June ready for the Games. TTC deployed over 1600 employees as customer ambassadors.
	2015	Toronto City Council approves a \$95 million (USD 71 million equ.) investment in the TTC Operating Budget. This will contribute to restoring services that were cut in 2011/2012 and to add new services.
Current ownership and oversight		<ul style="list-style-type: none"> <li>▪ TTC is wholly owned by the City of Toronto (referred to as 'the City' within this document). Toronto City Council is headed by a Mayor and 44 councillors. The Mayor's transportation agenda is influential, but while he is the only representative voted in city-wide, he carries only one of 45 votes when decisions are made. The City has approximately 40,000 employees and a population of 2.7million. Oversight is provided by the TTC Board, comprised primarily of Councillors representing Toronto City Council.</li> </ul>

<p>Complementary public transport and non-motorised transport services</p>	<ul style="list-style-type: none"> <li>▪ <b><u>Buses:</u></b> TTC operate the bus network in Toronto, while GO Transit operate commuter bus services into and out of downtown Toronto.</li> <li>▪ <b><u>Streetcars:</u></b> TTC operate 11 streetcar routes in Toronto across approximately 685 stops, constituting the largest light rail system in North America. Streetcars formed the majority of the original transport system in the city and were the original TTC's first transport endeavour, having been operated under franchises since 1861.</li> <li>▪ <b><u>Pedestrian infrastructure:</u></b> PATH, Toronto's downtown pedestrian walkway, as well as other pedestrian infrastructure, is partially owned and managed by the City of Toronto.</li> <li>▪ <b><u>Car sharing:</u></b> Toronto allows car sharing firms to operate including Car2Go, AutoShare and ZipCar.</li> <li>▪ <b><u>Cycling:</u></b> Cycling is managed by the City of Toronto and the existing cycling network includes cycle tracks and lanes, shared roadway routes and multi-use pathways. A Ten Year Cycling Network Plan adopted in 2016 by the City Council plans the development of Toronto's cycling network. BikeShare Toronto is owned by Toronto Parking Authority and operated by Motivate, which operates a number of bicycle sharing systems internationally.</li> <li>▪ <b><u>Taxis and other ride sharing schemes:</u></b> As of May 2016, taxis are part of the Toronto Ground Transportation Services. Taxi licenses are provided by the City of Toronto, including to Transportation Network Company (e.g. Uber and Lyft) drivers.</li> <li>▪ <b><u>Surface trains:</u></b> Surface trains are managed by GO Transit and Union Pearson Express, two divisions of Metrolinx. GO Transit is the regional public transit service incorporating buses and train lines for the Greater Toronto and Hamilton Area. UP Express is a dedicated express rail train, providing service between Union Station and Toronto Pearson Airport with a frequency of 15 minutes.</li> <li>▪ <b><u>Lake Transport:</u></b> A ferry service to the Toronto islands is provided by the city's Parks, Forestry and Recreation division. They also connect to the Billy Bishop Toronto City Airport, a small international airport located on the west end of the Toronto Islands.</li> </ul>
<p>Technical and operational summary as of 2015</p>	<ul style="list-style-type: none"> <li>▪ 68km under management - 79% underground, 3% elevated, 18% at grade</li> <li>▪ 27.6km of new lines under development (including 19km of light rail on Line 5 Eglinton)</li> <li>▪ 69 stations</li> <li>▪ 824 train cars, 1861 buses under management</li> <li>▪ 7120km of bus routes managed directly, with 58km of High Occupancy Vehicle corridors in the city (providing bus priority or priority for other multi-passenger vehicles)</li> <li>▪ 538 million passenger journeys per year</li> <li>▪ CAD\$1,115 million (USD 846 million equ.) in annual farebox revenues (2014/15)</li> <li>▪ CAD\$3,286 million (USD 2,494 million equ.) in total rev. / yr (2014/15)</li> <li>▪ Approximately 13,000 employees</li> <li>▪ 0km of network length opened between 2005-2015</li> </ul>

<p>Regulatory, oversight, and policy bodies:</p>	<p><u>Ontario Ministry of Transportation</u>: it is the provincial ministry of the government of Ontario. It is responsible for transport infrastructure and related law in Ontario.</p> <p><u>Metrolinx</u>: Metrolinx is the Province of Ontario's transportation authority; its principal interest with Toronto is in-out commuting. It is responsible for Go Transit, PRESTO, (the farecard ticketing system now being implemented by TTC that is compatible with the Provincial ticketing systems) and UP Express, linking Union Station with Pearson Airport</p> <p><u>TTC Board</u>: The 11-member TTC Board operates as an oversight body for the organisation and comprises 7 politicians and 4 public representatives. TTC's funding depends on convincing the City (and Province and Federal Government) it is performing well. The Board oversees matters of policy, planning TTC services such as constructing, maintaining, expanding and operating the system. It provides a strong influence on the definition of the public transport regulations for the city of Toronto.</p> <p><u>TTC Transit Enforcement Unit</u>: Responsible for safety and security on the TTC network and are able to enforce certain laws.</p>
<p>Summary of legal and policy framework:</p>	<p><u>City of Toronto Act (2006)</u>: Establishes the City of Toronto as the governing body of the city through this major reforming Act and is subject to review every five years.</p> <p><u>Relief Line Assessment Study</u>: This study has been developed by the City of Toronto's City Planning Division and the TTC. The study proposes a new rapid transit line to connect Line 1 Yonge-University-Spadina, downtown to Line 2 Bloor-Danforth, east of the Don River. This line will relieve crowding on Line 1 Yonge-University-Spadina, at Bloor-Yonge Station, and on the surface transport routes coming in and out of downtown.</p> <p><u>Official Plan Transportation Review</u>: it consists of a 5-Year Review of the City's Official Plan transportation policies, the development of a new long-term transportation plan, and the development of a funding and investment strategy.</p> <p><u>Big Move (policy created 2008 and updated in 2013)</u>: Created by the Metrolinx Board, this plan outlines a common vision for transportation for the Ontario region. Including expanding and improving currently public transport services.</p>
<p>Key stakeholders:</p>	<p><u>City of Toronto</u>: The governing body of the city. Councillors represent wards throughout the city and the current Mayor of Toronto is John Howard Tory, elected in 2014. TTC must work closely with the City Planning department in particular around integrated land-use and transport development.</p> <p><u>Official Plan Transportation Review</u>: Ensures that local people are able to review the long-term transportation plan, funding and investment strategy.</p> <p><u>Unions</u>: Union of Canadian Transportation Employees (UCTE) and the Amalgamated Transit Union has a local chapter in Toronto.</p>

## Summary of TTC and Key Views from Interviews

### Authority and Regulatory Structure

In 1998, the six regional municipalities of Metropolitan Toronto were amalgamated into a new single municipality called the City of Toronto (locally referred to as the 'Megacity'). There were previously two levels of councillor, some with a metropolitan mandate with responsibility and expertise in citywide functions (including transport), while others were elected for local areas. The new amalgamated City, designed to cut bureaucracy, created a one tier government with a City Council focused on both metropolitan city-wide and local issues. This provokes focus on issues with a local nature as this is what many of their constituents feel is most important, making securing agreement to major projects that have citywide impacts difficult, if they cause local problems.

The TTC Board operates as an oversight body for the organisation and its members are political representatives, primarily Councillors representing Toronto City Council. TTC's funding depends on convincing the City (and also the Province and Federal Government) that it is performing well. TTC's objective to prove it is a good steward of public funds is supported by extensive benchmarking results demonstrating that it has the lowest subsidy per passenger in North America.

### Management and Leadership

TTC's new management team was established in 2011 and concluded that "*what was required was a top-to-bottom renewal of the whole subway system*". The team has developed a new Vision and 5-Year Corporate Plan that responds to the challenges and opportunities facing TTC, providing consistent world-class service through "*a transit system that makes Toronto proud*".

TTC's Corporate Plan is the first of its kind in the organisation and was developed so that its staff could buy into TTC's corporate objectives. It was designed to be both realistic and aspirational, and to outline key deliverables when presenting a modernized TTC to key stakeholders: "*This is what it could be like if we all pull together*". The new management noted that in the past the problem was arguing about who was responsible for problems, instead of fixing them. The new emphasis was to be doing what its leading professional staff considered right, and learning by doing.

TTC's approach is to: "*keep it simple, improve what we do, and have a very clear plan for what we can control*". A key strategic aim is to secure extra funding that will enable TTC to become more proactive, professional and successful, ensuring stability when dealing with changing political leadership and competing priorities; critical to this is ensuring that TTC retains the CAD\$1 billion per annum (USD 750 million equ.) it needs to keep the system operating. TTC develops and recommends low-cost priorities to the Board that can be implemented quickly.

An example of TTC's approach in the context of reducing delay is as follows:

- *Clear objectives are set.* The Deputy Chief Operating Officer – Subways, the role responsible for subway operations, has committed to reducing passenger delays by 50% in 5 years. In 2013, TTC was scheduling 26 trains per hour (TPH) in the peak on Line 1 Yonge-University-Spadina, but only running 20.5TPH due to accumulation of delay.
- *Carrying out rigorous assessment of causes of delay and actions to reduce delay:* Rigorous assessment promotes comprehensive understanding of why delays occur, and their impacts on passengers.
- *Prioritisation and assessment of actions taken to reduce delay:* Rigorous prioritisation of activities to reduce delay within available funding is undertaken and their success, costs and risks are tracked. An example of an action taken is improved drain maintenance across the network; blocked drains were a cause of track floods and subsequent signal failures. A special train has also been procured to plug leak in tunnel walls and ceilings.

“Sorting out drains and roofs is not sexy” but is important as it contributes to service delivery.

- *Monitoring:* Continuous, with transparency and accountability for results. Their long-term strategy focusing on reducing delay means TTC are now running significant closer to the planned 25.5tph – radically improving the service promised to customers.

### Customer-focused Operations

TTC’s ridership characteristics are as follows:

Ridership on the public transport system	Increased from 380 million per annum in 1996 to 540 million per annum in 2015, carrying approximately 1.7 million passengers per day (across all TTC modes) Off-peak ridership is 60% of the total, and increasing rapidly
Passenger characteristics	Most have access to a car; and 11,000 car park spaces are provided and used, charging CAD\$4-5/day (USD 3-4 equ.) 57% are female
Public transport mode share	23-25% overall, but for downtown trips 75-80%
Interchange	<i>“The vast majority of subway passengers start journeys in buses/streetcars. There is an average 1.7 transfers per journey”.</i> The subway terminals are very large with typically 1000 feeder buses/day. 39 of 69 subway stations have bus/streetcar integration with interchange within the fare-paying area. This encompasses 85% of all passengers.
Transit network	4 subway lines, 11 streetcar lines, 150 bus routes
Fares	CAD\$3.25 (USD 2.45 equ.) within a maximum time for any journey and includes a transfer to another mode
Concessions	Child under 12 are able to use the system free; students and seniors receive a discount of 25%
Elasticities	Fares: 0.13 Service: 0.3 Elasticity to service levels are 2-3 times greater than elasticity to fares. These are context dependent, and there are thresholds that trigger larger responses
Customer satisfaction	Typically 75% (noting that customer satisfaction is not comparable between cities due to methodological differences in surveys). TTC is observed to have arguably the best modal integration in the world, leading to world-class last mile connectivity

TTC published its first Customer Charter in 2013, revised annually, which sets out 120 promises to customers. The aim is to serve customers so that they become advocates for TTC. This approach recognises that customers have to have a sense of ownership and that customers can become advocates for TTC. There is a 1000 person survey every 3 months to establish customer satisfaction and identify the important attributes they value; together with mystery shopper surveys of key stakeholders.

Comprehensive changes to procedures and processes have been identified that are now being implemented. Three key areas that will change the perception of the TTC brand and build support for the organisation are:

- *PRESTO*: An integrated farecard ticketing system which is compatible throughout the Province, and will eventually allowing TTC to remove its legacy token system. PRESTO can facilitate different pricing levels if deemed necessary. The TTC produced a business case in 2003 and concluded “there are no proven benefits of a smartcard system”. TTC now acknowledge that smartcard ticketing benefits customers, staff and creates useful planning and performance management data.
- Broader front-line staff service provision (using staff freed up by PRESTO)
- Use and improvement of real-time information.

Measures include strategic improvements such as opening an hour earlier on Sundays, as well as broader improvements to the travel environment, such as the introduction of litter-pickers at one terminal of each line. Customers are kept up-to-date with progress against defined targets by means of a Daily Customer Service Report, accessible online.

### Finance and Sustainable Funding

TTC’s financial characteristics across all its modes are as follows:

Subsidy per trip	USD 0.91
Farebox ratio	0.7 (30% subsidy)
Operating costs	USD1.6 billion per annum. 70% of costs are labour and workforce is unionised, with problems of overtime and absenteeism. TTC has purchasing power it applies for energy, for example, it buys diesel futures
Non-fare revenues	USD 45 million
Need for the coming 10 years	USD 9.3 billion, almost all for repairs

Securing predictable and sustainable funding is a core TTC objective; without this proactive management is difficult. The City of Toronto was granted revenue-raising powers by the Province, but since 1998 the Province contributes no subsidy to operations, meaning a major source of TTC funding was cut off. Federal Government funds for a major extension project are routed to TTC via the Province and City.

At present the City does not finalise TTC’s operating budget until February and only then is the level of subsidy for that calendar year known. Each year TTC defines the improvements it proposes and its Board (that includes 7 City councillors) proposes the annual fare increase. The resulting subsidy proposed is voted by the Board and are then negotiated with the City. Board approval for the budget to increase service requires different committees to agree over the course of 2-3 months; this is an area where TTC would like to be leading to allow for swifter funding allocation.

There are examples of innovative City funding. The Scarborough subway for example was planned to be part-funded by the City levying an earmarked 0.5% property tax over 30 years. A 10-year Water Renewal strategy was also funded by the City levying a 9% earmarked property tax. “*Toronto’s experience is that the public accepts tax if they know where it goes*”.

Funds for renewals compete with those for new build capital projects, so it is essential to prepare a sound business case to fully justify the scheme to the orders of Government involved, including lifecycle costs consisting of operating, maintenance and recapitalisation costs over 60 years. This is intended to help the City make more financially sustainable decisions, and enable state of good repair projects to compete for funding with expansion projects. The TTC aim of “*making sure our requirements are clearly understood*” appears to be productive, as the Federal Government has agreed to provide \$840million (USD 630 equ.) to be match-funded by the City for state of good repair projects. Though the Federal Government have contributed to new assets such as buses and the TYSSE extension, this is the first funding to support new and existing infrastructure after years of financial constraint, and goes some way to funding TTC’s anticipated funding needs.

### **Asset Management**

TTC’s new management almost 5 years ago concluded that “*what was required was a top-to-bottom renewal of the whole subway system*”. TTC had been rocked by an accident in 1995 that caused three fatalities, after a period during which there had been little funding for maintenance. The Coroner’s landmark ruling provided the basis for enhanced asset maintenance.<sup>1</sup> Today a substantive asset management strategy is being implemented with encouraging results.

TTC’s system is 60 years old in some places and improving the customer experience is contingent on maintaining state of good repair and replacing life-expired equipment with new technology that matches modern expectations. The first challenge is obtaining the necessary information to manage assets: TTC report that there are individual silos of asset management information, but no common system across the organisation. TTC has found that asset information (itself an asset) is easiest managed for assets that are standard in other industries, whereas it is hardest for anything that is transit-only such as tunnels and signalling systems because it is harder to build the skill sets and management systems.

The current area of focus is improving the way TTC prioritise investments in different areas. TTC have introduced multi-criteria business case appraisals for individual investments, which appraise the impact of a proposed investment on safety, economic value, customer value, and long-term subway sustainability. The next step will be to compare business cases to prioritise across business areas; “*Making sure we have the priorities right for the money we have*”. For example, if \$100 million (USD 75 million equ.) could buy a signalling upgrade or a station refurbishment, which will deliver most value? The 5-year plan is bringing together disparate projects into a coherent programme, and asset management planning is now looking 20 years ahead. By programming this way, TTC aims to harness multiplier effects as project benefits reinforce each other, such as to achieve a 50% reliability improvement over 5 years.

### **Planning, Network Development and Integration**

TTC’s network consisted of a comprehensive, integrated bus and streetcar system until 1954, when the first section of the existing Yonge-University-Spadina metro line was opened. Even when the system consisted of buses and streetcars, TTC insisted on integrated stations, so that interchanging passengers remained within the fare-paying area. This set the approach for a fully integrated multi-modal system, although space does not fully permit for this in the downtown core. Since the 1980s, demand for the metro has grown by 50% without any significant further expansion. Today’s 4-Line metro network is the result, and is complemented by 11 streetcar lines and 150 bus routes.

Metro ‘integration stations’ are planned as hubs where passengers interchange within the paid area. In practice a great deal of discussion takes place in each case, with TTC planners

---

1

[http://www.ttc.ca/About the TTC/Commission reports and information/Commission meetings/2009/August 26 2009/Reports/Russell Hill Subway .pdf](http://www.ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2009/August%2026%202009/Reports/Russell%20Hill%20Subway.pdf) (Accessed 4/7/2016)

involved from the very early concept stage. There are often conflicts between locating bus terminals (that are essential for high-quality interchange) and incorporating more retail at stations. Integrated development at stations is planned by means of low-cost connections to developments but coordinating the timing of delivering stations and associating developments is always problematic and safeguards are found, such as providing knock-out walls for future anticipated developments.

Responsibility for transit planning and environmental assessment is a City accountability and has recently shifted to the City Planning function. After more than a year working within the new roles and responsibilities, the TTC has identified refinements in the rebalance of this relationship. TTC continues to lead detailed metro design planning, because: *“We’re the ones that are going to operate it for 100 years, not the construction company or the engineer.”*

A project must be submitted for formal consultation when 5% of design costs have been incurred. An approved Environmental Assessment then has to be approved by the Province. The City leads land dealings with TTC as a key stakeholder to this process, as expropriation at market prices requires dedicated teams within TTC to secure City approval. The expropriation process takes 18 months and as a result negotiation is the preferred route.

### *Risks to Integration*

The City of Toronto has a strong, supported and approved City Official Plan (incorporating several other plans; a land use plan, transport plan, and detailed plans defining allowed densities), updated every 5 years. However, political debate usually focuses on the metro rather than the public transport system and is identified as the mode of choice in the Official Plan. This risks the crucial importance of multimodal interchange that TTC as an organisation strongly value: *“you can’t just think about the rapid transit...it’s not just about the rapid transit option...we provide the service from start to finish”*. An example of the politicisation of public transport policy and its impacts on the development of Toronto’s transport network is the experience of the Transit City plan. Transit City was jointly announced by the Mayor of Toronto, David Miller, and the TTC Chair as part of the wider Province of Ontario’s MoveOntario 2020 plan, and included major transport investments such as seven new light rail lines, an upgrade and extension to the Scarborough line, new bus rapid transit (BRT) and widespread improvements to reliability and frequency of bus routes. However, two major political obstacles affected this plan, firstly the indirect postponement of approximately \$4 billion (USD 3 million equ.) funding by the Provincial Government and subsequent adjustments to construction plans to facilitate this change in budget; and secondly, the campaign of incumbent Mayor Rob Ford to replace the Transit City plan in favour of metro expansion, rather than light rail. Ultimately, Toronto City Council members voted in favour of continuing to develop light rail on the Sheppard, Eglinton, Finch and Scarborough lines, and these projects have now been incorporated into a new regional transport plan managed by Metrolinx, The Big Move.

### **Major Projects, Modernisation and Expansion**

All projects must fit within an overall strategy for investing in the metro, recognising the synergies and interdependencies between major value-adding schemes. Renewing infrastructure, increasing capacity, introducing new vehicles, adding a 6 station extension to Line 1 Yonge-University-Spadina and a change in company culture all underpin the step-change required to secure TTC’s success to 2017 and beyond. These major projects are pivotal to the current 5 year Corporate Plan. Major projects currently underway include:

- Line 1 Yonge-University-Spadina line Subway Extension (8.6km), being implemented by Bechtel by the end of 2017. This project is funded by the national Government, Ontario Provincial Government, the City of Toronto and the Regional Municipality of York;

- Resignalling and Automatic Train Control (ATC): “*The absolute requirement to improve capacity on any system is to have moving block signalling*”. This system replaces the 1954 Yonge-University-Spadina line signalling to improve reliability and capacity by 33% from 25.5 TPH to 34 TPH. The project requires weekend closures and TTC acknowledge the difficulty of implementing brownfield projects such as this;
- PRESTO ticketing system: This is being implemented incrementally across all five transport modes in Toronto.
- Modernisation projects on Line 2: New trains to replace the T1, a new yard and maintenance facility, a new CBTC / ATC signalling system, introduction of One Person Train Operation (OPTO) and possible introduction of Platform Edge Doors. Doing these projects in the right order to ensure the underpinning infrastructure is fit for purpose can save hundreds of millions of dollars as well as saving time and minimising disruption.

A major project implemented is the Sheppard subway Line 4 that opened in 2002. Planned in the early 1990s, stations were located where land was zoned for intensive development but the economic recession has resulted in a metro with low demand. There was considerable ‘development flight’ during this period to outer areas in of the Greater Toronto Area where taxes were lower. The City responded by capping business taxes. Today there is some high density development, but it is residential, rather than planned offices. There are also examples of major projects which have not progressed as envisaged. The Scarborough subway extension involved the replacement of the now obsolete Scarborough Rapid Transit line (SRT). Cost controls due to higher than expected tunnelling and construction costs caused the project scope to be revised to an express subway between Kennedy and Scarborough Centre stations, as opposed to the 3 stop subway originally proposed. The Eglinton “Crosstown” LRT light rail project is being sponsored by Metrolinx, as part of its mandate to deliver regional transport projects. There is concern that value engineering may actually reduce station value (for example, through designing small, minimalist stations). Despite being sponsored by a different organisation, the line is a notable example of integration being fully-considered at all decision-making levels; the line will be connected to 54 existing bus routes and 3 metro stations. TTC will take over the operation of the line when it opens in approximately 2021.

Interviewees recognised that the challenges facing TTC are demanding: “*A major upgrading of the existing system and extensions/expansions is really, really challenging.*” TTC does not currently have a strongly-embedded institutional experience of managing major complex projects, owing to its focus on operations since the 1980s and the start-stop nature of many projects in Toronto: “*year 1 of any project is often wasted getting going*”. In TTCs view, a key priority should be the development of a Relief line, a project which has approval by Toronto City Council but is currently unfunded.

There are also examples of offering stakeholders quick wins that have been widely implemented. Before the last Mayoral elections in 2014, TTC identified 9 activities that were all beneficial, doable (‘shovel ready’) and prioritised and required slightly more subsidy to complete. These activities were detailed in a report for the outgoing TTC Board and included adding back off-peak services, restoring some high frequency services, expanding night services and investing in express buses. This strategy was successful and 8 of 9 initiatives have now been implemented.

### **Evaluating Investments**

Interviews commented that there is currently no single agreed method for evaluating investments as the City, Metrolinx, and TTC each use a different method. For example, the City looks at a wider set of criteria, whereas Metrolinx uses something similar to the UK WebTAG approach<sup>2</sup>. The result is that inter-agency discussions focus on the different

<sup>2</sup> <https://www.gov.uk/guidance/transport-analysis-guidance-webtag> (accessed 1/7/16)

methodological approaches, rather than the relative merits of the projects. The three organisations are collaborating to agree a single shared business case methodology to allow collective prioritisation of projects, build consensus and aid decision-making.

TTC expressed concern that they and the City are not up-to-speed with the latest transport modelling and appraisal procedures. For example they do not currently have good systems to identify, quantify and succinctly describe qualitative benefits. There are as a result difficulties in providing good qualitative and quantitative appraisals of transit options; and these necessarily adversely impact the quality of advice available to decision-makers.

## **Conclusions**

Today TTC is one of the world's most integrated multimodal transit agencies within Canada's major financial centre, but with an aged subway system that has received inadequate investment and now requires top-to-bottom modernisation. TTC faces the imperative of both modernisation and expansion plans, for which it needs to develop areas of expertise that have been allowed to dissipate.

### *Autonomy*

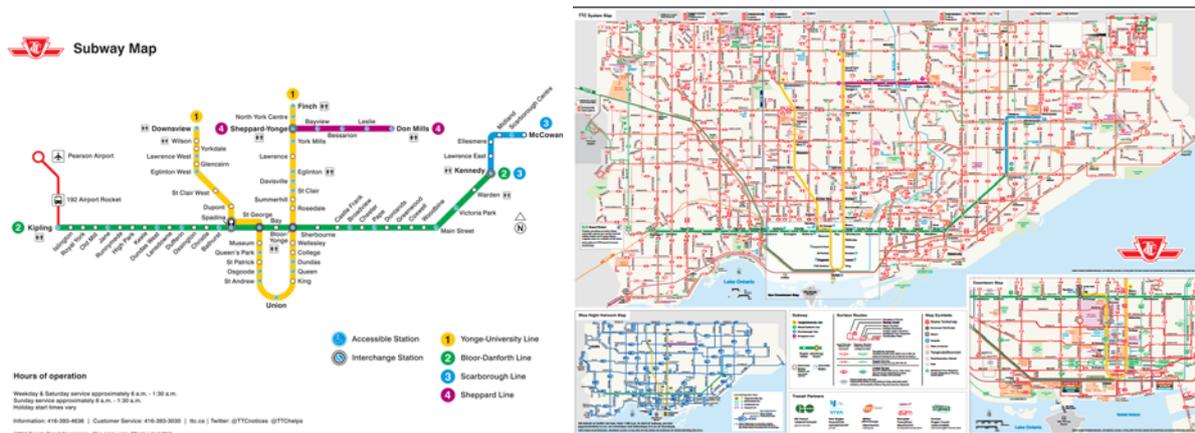
TTC reports to its Board and as such has considerable autonomy. TTC's CEO is appointed by the Board but other staff positions are left to management discretion. TTC can reduce staff if need be within the constraints of union agreements: "*There are no jobs for life at TTC... and we can release staff if – say – service reduces.*" It sets fares with the agreement of the City, and therefore has considerable control over revenues within the bounds of public acceptability. It makes resource allocation decisions when external funding is not required. However, large sections of the workforce are members of a trade union, so control over labour costs and outsourcing is somewhat limited. This has previously been an issue as TTC has sought to transform its working culture in parallel with its modernization plan.

### *Leadership*

TTC's management team has adopted a proactive approach despite the inherent challenges they face. New leadership and some new appointees have catalysed and liberated former employees and empowered all staff to be proud to work for a company that is demonstrably succeeding and improving the lives of Toronto's citizens. In 2012 the current CEO, Andy Byford, was appointed and given the necessary time to establish strong plans. The subsequent period has seen a transformation of TTC's effectiveness and prospects, something that a political appointee may not have achieved due to lack of technical understanding, and highlights the critical importance of leadership. A vision, Corporate Plan and the strong implementation of both have demonstrated effectiveness and created a favourable environment for effective engagement of TTC's key stakeholders. These are the City first and foremost, but also the Province of Ontario and the Federal Government who influence the funding of expansion projects. More widely, TTC's workforce are increasingly motivated; Andy Byford carried out an extensive consultation programme with frontline staff to demonstrate greater transparency and openness between roles and levels of the company. The results of benchmarking have been critical in demonstrating TTC's successes; facts that cannot be disputed and little-by-little build credibility that TTC is a serious organisation with a plan and capacity to deliver predicted success.

### *An Integrated Multimodal Public Transport Agency*

TTC thinks integration because it has to succeed within the North American context of private vehicle dependence. Its whole ethos is on continuing to deliver a fully integrated multimodal transit service, a value it has promoted and implemented since its foundation. TTC understands that public transport is the enabler of the economy in large cities and understands the primary and secondary benefits of integration. Even TTC's transit map demonstrates a comprehensive city-wide transit system, rather than "just" the metro.



TTC understands the pros and cons of the different transit technologies, and its mindset ensures it does not favour one mode over another, it focuses on its primary task of getting riders from A to B in the quickest time possible, via seamless transfers and with sufficient capacity. Each mode is recognised as having its specific merits, and TTC thinks in terms of the incremental development of the transit system. This thinking is rare in cities with metro organisations: they tend to plan for more metros, and may show less interest in other modes or the highest-quality integration.

### *Decision-making through 3 Levels of Government*

The city exists as a result of a law enacted by Ontario Province and the areas within this region have different needs. City development is relatively dense and has a high public transport mode share (for North America), while the contiguous areas of Ontario are low density, sprawling developments that are largely car-dependent, apart from commuters to Toronto downtown.

Tensions arise because Provincial commuters pay nothing in taxes towards TTC operational subsidies or modernisation projects (that are wholly funded by the City), but the Province partly funds TTC expansion projects and therefore has considerable influence over its priorities. Also the Province has 'imposed' its smartcard system on the City.

Expansion projects are typically funded in equal thirds by the three levels of Government, requiring all three levels to agree for anything to happen. Today the political complexion of the Federal and Provincial Governments is similar and there is considered to be a window of opportunity, although there are difficult financial constraints at this time. Even in this environment, gaining consensus is not easy: the Federal Government for example does not favour funds going to big cities, while the Provincial Government favours its own projects.

Decisions about expansion projects are traditionally political, and the role of TTC has been as an expert organisation advising the City on subway technical matters. Major projects have sometimes had poor success (for example, the Eglinton LRT was first tunnelled then filled in for at-grade running and Line 3 (Scarborough RT) with Linear Induction Motor technology is overcrowded but cannot procure extra cars). Looking ahead, one scenario is that Ontario Province may increasingly fund extensions. With this the question of whether TTC will automatically operate extensions or whether they will be operated under a concession model will follow.

City Planning's role adds a lens of city building when considering alternate routes. While there is some concern that planning decision-making has moved too far towards the City, TTC's intent is to redress the situation, ensuring good public transport integration and good development that are integrated together. It is TTC's experience that constant engagement is required with City planners throughout project development.

TTC's ongoing challenges are the following:

- Sustainable funding to provide its management team with predictability;
- Clarity around roles and responsibilities and governance of transit planning and expansion. The creation of TTC was meant to achieve this but increasingly decisions have become politicised and interviewees felt that the City increasingly sees TTC as day-to-day 'operators'. While these decisions have always been political in nature, TTC formerly had considerable influence; and
- Integrating land use planning with transit development more effectively, by being able to capture increases in development values for the City as well as promote transit-supportive development that generates dense ridership. Toronto City Council have recognized that there are effective funding strategies to secure both, such as a property tax as used to fund the Scarborough subway.

<b>Authorship:</b>		
<b>Written by (Imperial College)</b>	<b>Reviewed by (Imperial College)</b>	<b>Client (World Bank)</b>
<i>Priya Floyd, Research Associate</i>	<i>Richard Anderson, RTSC Managing Director</i>	<i>Dominic Patella, Senior Transport Specialist</i>
<i>Judith Cohen, Senior Research Associate</i>		<i>Atul Agarwal, Senior Transport Specialist</i>
<i>Roger Allport, Honorary Senior Research Fellow</i>		

## QUOTATIONS

<b>“You cannot be world class if you just take people from A to B.”</b>
“Customers need to have a sense of ownership”

### Operating a Metro

Quote	About
“[back of house operations] mandate is to get you from A to B... [front of house] make you feel valued while you’re with the system”	The Operator role and customer expectations
<b>“For metros around the world that are already open, the biggest challenge is brownfield resignalling.”</b>	
“The capacity hike is worth the wait”	Benefits of resignalling
“Moving to fix before failure not fix on failure”	Progression in approach to maintenance
“We are trying to do in 5 years what most companies take 10 years to do.”	
“We benchmark wherever we can”	To show that TTC is spending funding wisely
<b>“Once you lose state of good repair it’s almost impossible to catch up”</b>	...because more things are degrading
“To understand the ‘state of good repair’ you have to have a rigorous asset management system, understand the life-cycle of all assets and with this understanding answer the question: ‘How can the funds available have a major beneficial impact?’”	...because it’s hard to understand how big is the state of good repair deficit
“State of good repair always competes with expansion”	...state of good repair projects don’t end with a ribbon cutting ceremony
“Making sure we have the priorities right for the money we have”	TTC’s focus
“Never assume you have the right answer for what customers want. Often you are wrong and even small changes can have an impact on how you are perceived.”	Focus groups are useful. E.g. announcements – 60% are entirely ignored
“How do you define that reduction in journey time in money?”	On being able to quote qualitative and quantitative benefits of projects to customers
“This is what it could be like is we all pull together”.	TTC Corporate Plan
“How would anyone trust us as competent stewards to invest if we can’t even keep our bathrooms clean?”	The need to be a competent operator before asking for more money

## Governance, Regulation and Leadership

Quote	About
"There were no women on the executive...we now have 30% women."	The organisational value of diversity, with more women and minorities, all hired on merit
"There was never an equals sign in that equation."	Reduction in provincial funding from 75% of capital to 1/3 of capital, with the city picking up the rest of the tab
"All future increase capacity of the transit system should be provided by public transport."	Supportive policy of the city of Toronto (compare with Hong Kong's "rail is the backbone" policy)
"What looked like an efficient thing...you got every politician away from thinking regionally"	And instead focusing on local potholes. Fewer politicians and staff = saving money but worse decision-making
"Suddenly, politicians want to align themselves with TTC because they love success stories."	...and then politicians are motivated to provide the cash.
"I'm advocating for my customers...that's my job."	
"Having [the politicians'] confidence is crucial"	
"Try to get as simple a [corporate] structure as you can."	Complexity leads to infighting
"It's remarkably light touch"	TTC's regulation
"Toronto's experience is that the public accepts tax if they know where it goes."	Funding by new taxes
"They tend to forget about the importance of the bus network"	The city's long-term planners, and the complementary use of the bus network

## Paying for the Metro

Quote	About
"All-out campaign for sustainable, affordable funding"	What TTC needs
<b>"At some point you will be forced to make a big increase...it will undo all the good that fare freezes would have done."</b>	The consequences of failing to put up fares annually in line with inflation
"The funding we need is always beyond their capacity to provide it."	
<b>"We operate on a year to year basis."</b>	Won't know 2017 funding until Feb 2017.
[say to government] "If we don't get that money, here's the predicament we're going to be in."	Stakeholder engagement for sustainable funding
[need to show that] "It's an investment, not just spending more money."	
"Preserve what you have, and then add to it."	Try not to get carried away spending all the money on extensions

## Major Project Development & Planning

Quote	About
<b>“If you do [key projects] in the right order, you can do it faster and cheaper.”</b>	
“You want people above it in high rise buildings where you can.”	High density development around metro stations
“The land use cannot be removed from the transit.”	Transport-land use planning need to be integrated
“We’re the one that’s going to operate it for 100 years, not the construction company or the engineer.”	If and when a PPP is used in future, TTC would always dictate the standards and development process
“In the past they all seemed to be disconnected individual projects.”	...which were brought together by the five year plan
<b>“Let’s just stop and map out what the perfect portfolio would look like”</b>	The first step to achieving economies of planning
“Getting funding is a big enough challenge without...constantly reinventing the wheel.”	Dealing with constant revisions to the Transit plan
<b>“If you build a metro, eventually the ridership will justify it. But you need to live between now and then.”</b>	...so build it where the ridership is already established, or build the transit-supportive development at the same time.
“I prefer to see incremental growth”	Converting corridors from bus to LRT to subway as ridership grows

## Metro Design to Support Success, Integration & Connectivity

Quote	About
“We insisted on integrated stations such that the streetcars and buses actually came into the station.”	
“The absolute requirement to improve capacity on any system is to have moving block signalling”	
<i>“We only want proven technology here”</i>	
“We assign mode to demand...around 10k passengers per hour, that is subway territory”	Hierarchy of modes: bus – BRT – streetcar – LRT – metro
[integration] “allowed us to speed up the way we operated the service.”	In-station transfer is better operationally as well as for customers
“Could [in-station transfer] be done if the buses were run by someone else? Yes, it could be.”	
“[interchange areas are] a fundamental part of our design standards.”	
“There’s a capital cost of providing that excellent integration.”	It costs more in the short term and is more valuable in the long term
“[de-integrating modes] would make the system less efficient”	
“The voice of the customer has an important part to play.”	Emulate Apple – give customers the shopping experience they deserve
“Ideally you get the system ready before you have customers using it”	Implementation in Toronto is incremental, which is unusual